VOL. 12, No. 10 OCTOBER, 1935

Medical Library
QV.5
A5
J86
065
v.12
no.10

# The AMERICAN JOURNAL of OPTOMETRY

EDITORS

CAREL C. KOCH JACK I. KURTZ

COLLABORATORS

E. B. Alexander, *Duncan, Okla.*
Earl Allgaier, *Ames, Iowa*
J. Fred Andreae, *Baltimore, Md.*
J. O. Baxter, Jr., *New Bern, N. C.*
J. O. Baxter, Sr., *New Bern, N. C.*
L. L. Beacher, *New York, N. Y.*
Robt. T. Best, *Fairmont, Minn.*
W. I. Brown, *New Bedford, Mass.*
J. T. Campbell, *Washington, N. C.*
Brant Clark, *Los Angeles, Calif.*
J. Robinson Cohen, *New York, N. Y.*
Paul Dill, *Greeley, Colo.*
Howard C. Doane, *Boston, Mass.*
J. H. Drakeford, *New York, N. Y.*
G. L. DuPlessis, *Minneapolis, Minn.*
T. H. Eames, *West Somerville, Mass*
Wm. Feinbloom, *New York, N. Y.*
L. P. Folsom, *South Royalton, Vt.*
Harry Lee Fording, *Portland, Ore.*
F. W. Freeman, *Anderson, Ind.*
M. Gilbert, *Owosso, Mich.*
W. H. Glazer, *Philadelphia, Pa.*
R. M. Hall, *Cleveland, Ohio*
C. J. Hathaway, *Pontiac, Mich.*
C. K. Haynes, *Jamestown, N. Y.*
Norman B. Hays, *Niagra Falls, N. Y.*
W. Jerome Heather, *Chicago, Ill.*
A. E. Hoare, *Los Angeles, Calif.*
H. S. Horton, *Cleveland, Ohio*
E. E. Hotaling, *New York, N. Y.*
Charles E. Jaeckle, *Newark, N. J.*
C. H. Johnson, *Philadelphia, Pa.*
H. D. Judd, *Detroit, Mich.*
B. E. Kehl, *St. Louis, Mo.*
L. H. Kraskin, *Washington, D. C.*
Alvhh R. Lauer, *Ames, Iowa*
C. V. Lyons, *San Francisco, Calif.*
G. A. MacElree, Jr., *Phila., Pa.*
F. L. Mason, *Berkley, Calif.*
D. J. Mayer, *Riverside, Calif.*
O. L. McCulloch, *Holyoke, Mass.*
F. McFadden, *Rutland, Vt.*
O. J. Melvin, *Omaha, Nebr.*
William B. Needles, *Chicago, Ill.*
J. C. Neill, *Philadelphia, Pa.*
J. F. Neumueller, *Woodbury Heights, N. J.*
Geo. D. Oertel, *Syracuse, N. Y.*
G. O. Ohlsson, *Detroit, Mich.*
C. R. Padelford, *Fall River, Mass.*
D. R. Paine, *Topeka, Kansas*
J. I. Pascal, *New York, N. Y.*
R. J. Pearce, *Greensboro, N. C.*
R. M. Peckham, *Rochester, N. Y.*
Geo. A. Perkins, *Ord, Nebr.*
Ernest Petry, *Rochester, N. Y.*
Harry E. Pine, *Chicago, Ill.*
S. H. Robinson, *Prescott, Ariz.*
E. LeRoy Ryer, *New York, N. Y.*
H. Leslie Salov, *Newark, N. J.*
Z. J. Schoen, *University, Viriginia*
Charles Sheard, *Rochester, Minn.*
Carl Shephard, *Chicago, Ill.*
R. E. Simpson, *Pasadena, Calif.*
William Smith, *Dorchester, Mass.*
H. Riley Spitler, *Eaton, Ohio*
M. Steinfeld, *Paducah, Ky.*
Edwin F. Tait, *Philadelphia, Pa.*
William J. Tait, *Philadelphia, Pa.*
W. O. Vivian, *Media, Pa.*
R. N. Walker, *Winston-Salem, N. C.*
A. P. Wheelock, *Des Moines, Iowa*
A. Whitaker, Jr., *Bridgetown, N. J.*
E. G. Wiseman, *Buffalo, N. Y.*
Arene T. Wray, *Los Angeles, Calif.*
Lloyd K. Wyatt, *Peoria, Ill.*

Published Monthly by the AMERICAN JOURNAL OF OPTOMETRY PUBLISHING ASSOCIATION,
1501 Foshay Tower, 821 Marquette Ave., Minneapolis, Minn.

ANNUAL SUBSCRIPTION $4.00. CANADA AND FOREIGN $5.00.
Single Copies, 45c.

Entered as second-class matter February 20, 1924, at the postoffice at Minneapolis, Minnesota, under the Act of March 3, 1879.

UNIVERSITY OF MICHIGAN
MEDICAL LIBRARY

It takes eight months to build and season a pot of proper quality in which to mix and melt Soft-Lite glass. That's characteristic of the quality idea at Bausch & Lomb, makers of Soft-Lite Lenses.

❖

SOFT-LITE LENSES HAVE BEEN STANDARD GLARE ABSORPTIVE LENSES OF THE WORLD FOR OVER A QUARTER CENTURY

❖

SOFT-LITE LENS CO., Inc.

NEW YORK CITY

# AMERICAN JOURNAL OF OPTOMETRY

Vol. 12 OCTOBER, 1935 No. 10

## CONTENTS

ORIGINAL PAPERS
The 18 Point Refractive Routine as Presented by the Graduate Clinic Foundation. Louis L. DeMars . . . . . 377
The Treatment of Squint Cases. J. I. Kurtz . . . . . 390
A Basic Technique in Orthoptics. Part III. William Smith . . . . . 394

EDITORIALS
Optometric Investment in Equipment . . . . . 402

SPECIAL REPORT
Suggestion for Adequate Optometric Extension. James O. Baxter Jr. . . . . 404
Modern Methods of Practice Building. George C. Jenson . . . . . 408

BOOK NOTICES
Psychology and Health. H. Banister . . . . . 416
Blindness and the Blind in the United States. Harry Best . . . . . 417

---

STATEMENT OF OWNERSHIP

Management and Circulation as required by the Act of Congress of August 24th, 1912, of the American Journal of Optometry, published monthly at Minneapolis, Minnesota, for October 1, 1935.

State of Minnesota, County of Hennepin—ss.

Before me, a Notary Public in and for the State and County aforesaid, personally appeared Dr. Jack I. Kurtz, who having been duly sworn according to law, deposes and says that he is the Business Manager of the American Journal of Optometry and that the following is to the best of his knowledge and belief, a true statement of the ownership and management of the aforesaid publication for the date shown in the above caption required by the Act of August 24th, 1912, embodied in Section 411, Postal Laws and Regulations, to-wit:

First, that the names and addresses of the Publisher, Editor, and Business Manager are as follows: Publisher, The American Journal of Optometry Publishing Association, 1502 Foshay Tower, Minneapolis, Minnesota. Editor, Dr. Carel C. Koch, 1502 Foshay Tower, Minneapolis, Minnesota. Business Manager, Dr. Jack I. Kurtz, 1502 Foshay Tower, Minneapolis, Minnesota.

Second, that the owner is The American Journal of Optometry Publishing Association—Dr. Carel C. Koch, President, and Dr. Jack I. Kurtz, Secretary and Treasurer.

Third, that there are no bondholders, motgagees, or other security holders owning or holding one or more per cent of the total amount of bonds, mortgages or other securities of this publication.

DR. JACK I. KURTZ, Business Manager,
The American Journal of Optometry.

Sworn and subscribed before me this 28th day of September, 1935.

ERMA BROADWELL, Notary Public,

(My commission expires Nov. 27, 1940).

Hennepin County, Minnesota.

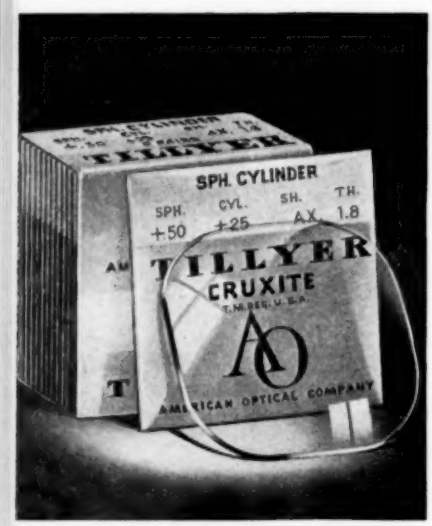
# EVERY LENS REQUIREMENT!

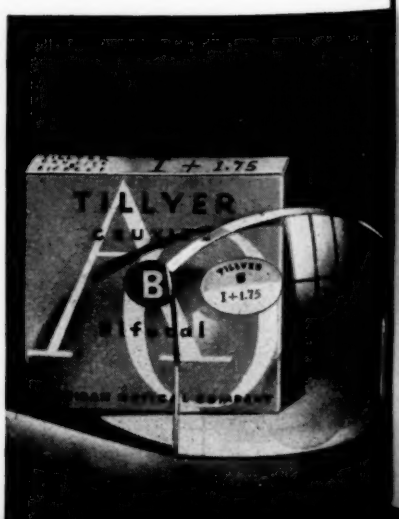
*Can be filled in*

**Cruxite lenses are made in many forms... to provide freedom from glare for all your patients. Then too, Cruxite is available in four shades, each in its degree, protecting the eyes from indoor and outdoor glare. There is**

CRUXITE LENSES

## American Optical





AMERICAN JOURNAL OF OPTOMETRY

Vol. 12 OCTOBER, 1935 No. 10

# THE 18 POINT REFRACTIVE ROUTINE AS PRESENTED BY THE GRADUATE CLINIC FOUNDATION*

Louis L. DeMars, Opt.D.
Minneapolis, Minn.

THE EIGHTEEN POINT TECHNIQUE is a modern method for examining and testing eyes optometrically in a thorough and an orderly manner. By it every necessary examination is made in its proper sequence and every necessary test or measurement is made or taken in its logical order. By that I mean under the most favorable conditions toward obtaining the exact findings. The purpose of the whole, being, to enable one to make a quick and a true diagnosis and to know definitely what procedure to follow for correction and relief.

You will have noticed that the writer has used both the words examinations and tests. While the whole procedure is universally referred to as an "examination of the eyes," yet there is a distinction. An act of examination is one in which the operator looks at or in the eyes without any responsibility on the part of the patient. A test or a measurement is when the operator, using some device shares some responsibility with the patient, in arriving at right findings. In both of them correct results depend upon the knowledge, experience and skill of the refractionist.

Imagine if you can the entire "set up" of the visual apparatus, the eyeballs with their lenses, cilliary bodies, irises and the rest of the contents, the orbits with all the extrinsic muscles, check ligaments, etc.; the optic tracts, the visual centers in the brain; the nerve centers and the ganglia of the 2nd, 3rd, 4th, 5th, 6th and 7th pair of cranial nerves and even the nerve fibres themselves. Imagine all of this in perfect order, yet, it will not function without nervous energy in adequate quantities properly distributed and directed.

After a skillful examination with the ophthalmoscope and the ophthalmometer has definitely established the absence of any hampering pathology or irregularity in the fundus of each eye in their medici or on their surfaces, it is plain common sense to regard all refractive

*An abridgment of the material presented before the Minnesota Academy of Optometry at Minneapolis, September 22, 1935.

work as an act of measuring the amounts of nervous energy being supplied to or inhibited from the different ocular functions. It then does not make any difference whether the eye balls, when in a static condition, are too long or too short.

When a child is born with two good eyes, these eyes are only good as far as their anatomical parts are concerned. So far as their ability to function for the demands to be made upon them in mature life, there is but little. Even the physiological parts are not fully developed so nature continues her work, and, finishing, begins to train the eyes to adapt themselves for the necessary functionings. Thus, that most important function fusion, it is said is not maturedly developed until the 6th year of life. Fusion, you know, is the overwhelming desire on the part of the visual centers in the brain to see but a single image out of the two which are received from the eyes.

Whenever ill effects such as malignant disease, accident, or abuse befall children's eyes during the precious formative years, vision is apt to suffer.

Vision is the result of seeing. We see with our eyes let us say, but the function of vision takes place ultimately in the brain. In order, therefore, for perfect vision, the vision centers demand an equally clear image from each eye and both so placed that when reaching the brain they will instantly be fused into one.

During the years of infancy this is just what the eyes and the visual centers of the brain are learning to do; to focus a clear image on the retina through the efforts of the ciliary muscles on the crystalline lens and simultaneously fusing them into one image by making them fall on corresponding nerve fibers in each retina by contraction of the adductor muscles.

Whether the diameter of the eyeballs from the cornea to the retina when the eyes are in a static condition are too long or too short or just right makes no difference, the flow of nervous energy must go over the nerves to make the muscles obtain the results which good vision demands. At first the results come by trial and error and later by slow process the fusion centers learn to send instanter just the right quantity of energy for any individual point looked at be it near or far.

This is now known as the "Brain Pattern." It is the existing way the visual centers have learned to distribute the nervous energy to get the results it requires in the most comfortable manner. By neglect, abuse, ill-advised efforts or disease, Brain Patterns are frequently altered. This sooner or later becomes the cause of strain and discomfort making it necessary for the optometrist to use various means to recondition vision and re-establish the normal brain patterns.

Brain patterns, let me repeat, are the existing way that the visual centers have learned to distribute the nervous energy to get the results they demand, namely, a clear single image of the object on which the at-

tention of the mind is fixed with both eyes working. We determine brain patterns by proper diagnostic use of prisms and lenses.

A point of stimulation as used in optometry is any point or object at any distance from which the wave vibrations which stimulate the sensitive nerve fibers in the retina, reflect or emanate. A point of stimulation may be at infinity, at near or at any intervening distance but that distance must be definitely known.

Place any lens or prism of known power before an object, the distance of which is also known and you know definitely what it will do to the rays emanating from that object.

Place before a pair of eyes any object at a known distance and that object becomes the point of stimulation. Now you know what ought to take place in those eyes and their visual apparatus if they are normal, and, knowing what prisms and lenses do to rays emanating from that object, you can impose them to determine the normality or otherwise of that function or any function.

With no pathology present when is a pair of eyes and its visual apparatus normal? A pair of eyes and its visual apparatus is normal when, during the pre-presbyopic years of age, the visual acuity is good or at least fair at both far and near distances and no difficulty or discomfort is experienced under any ordinary circumstances.

When preparing this paper, I asked the question of a number of refractionists and almost invariably the answer was 20/20 vision, so much adduction and abduction and so on but I question this answer.

Practicing optometrists know that there are people who have 20/15 and even better visual acuity as well as those whose acuity is 20/30 and are satisfied because they are not bothered in any way by their eyes or vision.

We have found pairs of eyes with good 20/20 vision and yet other findings made in the same case were found to be so much below the minimum expected that the informed refractionist has wondered how this pair of eyes could possibly give the good comfortable vision they enjoy with such little complaint of strain, which the patient reports.

In the latter instance, why was it that the visual acuity remained so excellent and the other functions so low according to the standards set for them? It is for this reason. When there is danger of seeing double because of an insufficient supply of innervation arriving from its special nerve center, the visual centers of the brain direct the setting up of a defense mechanism to prevent the double vision. A defense mechanism is an altering of the usual brain pattern of nervous energy to the eyes to prevent seeing double and poor acuity. This altering of the brain pattern can continue without causing discomfort in the eyes until some great stress or abuse of the eyes is being carried on, which causes exhaustion and discomfort results. This altering of the brain patterns cause wrong habits of action to be acquired by the ocular muscles which

often necessitate a retraining or a reconditioning until a proper adjustment of the brain pattern takes place.

If one regards any pair of eyes as is, after they have passed through all the vicissitudes of growth, development, acquired habits, etc., to the state of maturity and on until they are brought to one's attention because of poor vision or discomfort, if, one regards them in that light as being normal so long as two eyes see reasonably well and there is no discomfort, then and then only will the eyes come under the jurisdiction of the refractionist.

The patient now visits the optometrist. Be the symptoms dimmed vision, unequal vision, headaches or eye-strain, just what is the optometrist going to do about it? First he must assure himself that no pathology exists, of a kind that would hinder a successful conclusion of the case. Thus assured he employs intelligently and methodically every means at hand to search out the cause of the trouble or discomfort of which the patient complained.

The means at hand which the optometrist uses can only be concave and convex lenses and prisms arranged in various forms for quick and accurate use. Concave lenses are used to excite and draw from the nerve centers to the muscles which operate the special function or functions upon which we want to work or which we wish to test: convex lenses are used to inhibit nervous energy from coming, when necessary from the nerve centers to the muscles of the same or other functions and prisms excite the nervous energy coming to the muscles under their apices and inhibit it to those under the base.

Since all lenses and prisms are numbered according to their refractive properties in diopters, so, when used before the eyes they become measures of nervous energy expended or inhibitd.

It follows, then, that one cannot place before one or both of two seeing eyes fixing on a point of stimulation any sphere cylinder or prism without altering in some degree the existing brain pattern of nervous energy for that point.

The optometrist understands and appreciates the value of all of this. He knows that it is his duty to get all the refractive data not only visually and refractively but muscularly as well.

To assist him he has a Minimum Table of Expecteds which has been set up or evolved from the experiences of many competent men over a number of years. The amounts listed for each one of the tests are not intended to be the exact amounts that a patient must show to manifest normalcy, but they provide a definite line "to hew to" and point the way to a very reasonable and correct diagnosis.

Let me remind you that in each of these tests you are measuring, in some instances, the amounts of nervous energy that are used to obtain good binocular vision, or you are measuring the amounts of nervous energy which the brain centers have in reserve. In other instances you are

measuring the amounts of nervous energy which can be inhibited by a certain function while single binocular vision is still maintained.

In other words, the execution of the 18 or 21 point examination, methodically making each one of the tests in turn and recording them, then comparing each of them with their expected, gives you a picture of the entire visual apparatus. With the minimum expecteds as a starting point you are able to find out where the amounts of nervous energy supplied the various functions are too great in comparison with the work it has to accomplish or too little, if it is not normal.

No one or two findings in any case are of any value by themselves. Not until the whole number of examinations and tests has been completed and recorded can a true survey of a case toward an accurate diagnosis of the cause of the chief complaint be made. Recalling that over the 3rd cranial nerve, the stimuli which makes muscles act, go to at least 6 of the ocular muscles which have to do with producing single binocular vision. So that for instance, the nerve centers controlling the amount of nervous energy to make the accommodation do and maintain the work demanded of it is not sufficient, then by reflex action a greater stimulus must be sent to the adducting muscles, via the same nerve, to force the accommodation to function, thus causing a feeling of strain upon the eyes.

Now, how does the refractionist find out about the existence of this condition? Even if he guesses about it after one or two tests, how does he know definitely to his own satisfaction what he should do about it? He does not know and if he prescribes without knowing his chances of success are small.

We will now review a case similar to the one mentioned. I will not use the numerical terms that the graduate clinic refractionists have been trained to use, recognize and understand, so many explanations must be included to make this clear.

This patient is not of presbyopic age; has worn no lenses; has 20/20 vision with each eye separately but complains of general frontal headaches and temples and of a great deal of eye-strain especially at close work and after.

Using the ophthalmoscope, the fundus, though otherwise normal in appearance, shows a slightly brightish red throughout as though reflexly irritated by strain. This fact we write into our record because we will want to know if it has disappeared when we are through with our case.

The ophthalmometer findings are recorded as "nil" after the Javal rules have been applied, so we prepare to find the existing habitual phoria with the eyes directed toward some test object at infinity. We do this at this time because we must know the kind and amount of phoria that these eyes have had to overcome to maintain single binocular vision for infinity before we impose a single lens or prism and thus alter, however

slightly, the Brain Pattern. But, knowing this, one is enabled to see just how the Brain Pattern is changed toward the expecteds in subsequent tests.

(Note) Should any other patient of pre-presbyopic age have been wearing lenses to correct his distance vision at the time his habitual phoria is taken, his old correction should be worn during the test.

Then, while one is at it, the finding for the habitual phoria at near or at the habitual working distance (usually 16 inches) might as well be taken for all of the same purposes. As stated in the note above if the patient is pre-presbyopic the lenses that have been worn for distance should be worn in this test also. Again, if another patient is tested for habitual phoria at near and is presbyopic and has been wearing his presbyopic correction, he should wear these lenses during the test.

After all, the findings at the habitual working distance are the deciding factors in most cases because we use our eyes more at near distances and it is here that the excesses or discrepancies causing ocular discomfort are bound to be noticed, therefore, in the use of the 18 or 21 point technique the first 12 examinations and tests are nearly all of diagnostic being of analytical value to the remaining near point tests.

Our findings for habitual phoria at distance show orthophoria and at near 4 prism diopters of exophoria, which we write on our record sheet opposite their minimum expecteds of one-half prism diopter of exophoria and 6 prism diopters of exophoria respectively.

We follow now with the retinoscopic examinations of which we make 3 findings. One static and two dynamic. The static is made as usual with a working distance at 40 inches, while a dynamic finding is made at 16 inches and another at 40 inches. Why, you ask, do you make so many? Why does any skilled and careful mechanic want to know what his machine will do under different conditions calling for great stress or otherwise?

About these 3 retinoscope findings, unless all of them are alike when their net findings are recorded and these findings agree with the subjective test, unless they do we are made aware that there is an excess amount of nervous energy being used in some of the muscles of those eyes to maintain clear comfortable and single binocular vision and an insufficient amount sent to the other muscles.

In the 18 point technique the subjective test is the next to be made and this finding becomes the minimum expected for each and all of the retinoscope findings. In this case our finding is a plus 1.00 diopter sphere for each eye, but looking back over the retinoscopic records, there is agreement in the static finding while the dynamic record gives OU+200 diopter spheres at 16 inches and only 1.50 diopter spheres at 40 inches.

Of all the findings determined with the retinoscope, that at 16 inches calls for more attention as it is a decided near point finding requiring strict collaboration between accommodation and adduction and therefore involving a certain amount of "lag" which must be deducted

to obtain the net result. The amount of this lag will be found later on in the examination.

Now with the plus one spheres of the subjective correction before the eyes has the aspect of the phorias been changed? After making a test for the phoria induced by the lenses we find no change, orthophoria still obtains. Since plus lenses have an inhibitory effect on accommodation and reflexly to adduction, why isn't the finding changed to an exophoria?

The next unit considered in the 18 point technique is the true adduction. The minimum expected of this is from 7 to 9 prism diopters but in the case in hand it is only 5, showing that there is not a comfortable play between the two functions of accommodation and convergence. In other words, there is rather a tight hook up.

Passing on to the ductions which are the gages that inform us of the amount of nervous energy these functions have in reserve to maintain single binocular vision, we test for two things in each; first the "break" where the eyes see double and second, the "recovery" which is the point where fusion again takes place. The first shows how far one can go before fatigue sets in, the second gives us information as to how promptly the urge to fusion occurs and whether it is strong or weak.

In the case we are testing the adduction shows the break to be 24 base out prism dipoters and the recovery to occur at 19. The minimum expecteds are 19 break and 10 recovery, which places this finding so high and good that it needs no more attention until we are ready to compare it with the corresponding near point tests.

With abduction our findings are 13 base in prism diopters to break and 5 to recovery. Like adduction this seems all right too but the amount of the recovery spoils it. The minimum expecteds being only 9 break and 5 recovery, with so high a break, to be in proportion, the recovery should equal one-half of the break.

On making tests of the vertical phorias and duction we find them equal to the expecteds so record them as negative.

Our records will now show the following findings: (a) and (b) Ophthalmoscope and ophthalmometer show both findings negative or normal.

(c) Habitual phoria at far orthophoric.
(d) Habitual phoria at near 4 prism diopters of exophoria.
(e) Static retinoscope at 40 inches OU+1.00 D spheres.
(f) Dynamic retinoscope at 16 inches OU+2.00 D spheres. (g) at 40 inches +1.50 D spheres.
(h) Subjective test OU+100 D spheres.
(i) Induced phoria . . . orthophoria.
(j) Adduction—Break 24 base out prism diopters: Recovery 10.
(k) Abduction—Break 13 base in prism diopters: Recovery 5.
(l) Vertical phorias and ductions are negative.

If you made no more tests with this case you would probably prescribe the subjective finding because both that and the static retinoscope agree, the two phorias appear favorable, and, according to the ductions there seems to be a sufficient amount of nervous energy supplied for all purposes. So, why bother about what the dynamic retinoscopy findings may mean?

But they do mean something and give important information. In the 18 point technique no single finding, nor any 2 or 3 findings can point to a diagnosis you can be sure is right. Satisfactory diagnoses are only reached after all the findings have been made, compared with their minimum expecteds and with each other and then analyzed as a whole.

Referring back to our case, the patient was back in a week or so as requested but reported that the lenses had not given the relief at close work as expected so another examination is in order. In remaking the different tests, the findings are the same as before so we will take all the near point tests this time.

You will remember at the start of this case, before we imposed any lenses before the eyes we found the habitual phoria for distance and another at near.

Now in beginning the systematic examination of the eyes under working conditions at the nearpoint as we have already done at the far point or infinity we choose the work distance of 16 inches and make all tests at that point. Of course, if our patient's working distance is known to be any other distance as at 13, 18 or 20 inches, we would set the test targets at any of those distances instead of 16. This, however, would make necessary some different calculations if we wish exact findings.

In testing at near points, we are working under entirely different circumstances. If we are going to work with the general point of stimulation at 16 inches and the patient's pupillary distance is 60 mm. we must reckon with the fact that a pair of eyes uses 2.50 diopters of accommodation at least to see clearly at that point and at least 15 prism diopters of adducting power to avoid seeing double.

We begin first by adjusting our apparatus for near point work, by narrowing the pupillary distance as much as necessary. Then we start by taking the habitual phoria again, but this time with the +1.00 subjective finding before the eyes. The test shows 4 prism diopters of exophoria (the same as the previous finding) even under the inhibiting effect of the plus lenses. The minimum expected being 6. This is evidence that some irrgularity exists that will be useful when the final diagnosis is made.

The next logical factor to investigate is the existing status of the efforts put forth by the two associated functions of accommodation and adduction. In which one is the excess effort, if any, being made at the expense of the other to maintain single binocular vision?

We know that there is a close interlocked relationship between the two functions and that any plus lens that the eye accepts and sees as good or better through, than without, measures in diopters the amount of nervous energy used in excess by the accommodation of the amount locked up with adduction. This is the same as when any base-in prism needed to correct any exophoria measures in prism diopters the amount of nervous energy used by adduction in excess of the amount locked up with accommodation.

We now proceed with this analytical test—the disassociated crossed cylinder and the induced phoria which it begets. In this test, the patient's vision is directed to a crossed cylinder target throughout. We then impose before the eyes of the patient the subjective finding and a 6 prism diopter base down before the left eye which disassociates the vision of the two eyes so that fusion is impossible. Also we impose a pair of crossed cylinders with the minus powers in axis 180 degrees. This latter instrument properly employed, locks up all accommodative effort, after the excess amount has been measured with lenses.

We now have the eyes (because of the crossed cylinders) in a position in which we can measure any accommodative effort the eyes may have been using up to the 2.50 diopters absolutely necessary to be able to read at 16 inches. With the case in hand the findings are 250 D gross from which, if we deduct the strength of the subjective finding which is +100 D we have a net result of 1.50 D.

Without removing any of the lenses, prisms or crossed cylinders from before the eyes we take another inducted phoria finding. This proves to be 10 prism diopters of exophoria.

With the last two results in mind, how do we use them? In the first we have determined that the eyes have been using 1.50 D of accommodation in excess of the necessary amount. In the second we have found that the adduction has been using 10 prism diopters more than the necessary 15 to maintain single binocular vision. So let us resolve these findings into fractions. The first would be 150/250 or 3/5; the other 10/15 or 2/3. Since the 2/3 of the adduction is the larger fraction, it shows that the fatigue effort is being made in that function.

The last two findings were obtained at 16 inches like the findings of dynamic retinoscopy. The results too are nearly equal insofar as the accommodation is concerned. If the induced phoria had been taken then, it would have been about the same as it is now.

Since there is always a lag in the accommodative effort behind the adductive and the closer the point of stimulation the greater this lag, it has been worked out by research that three-quarters of a diopter be allowed for the first 6 prism diopters of exophoria—the expected at 16 inches and +.37 of a diopter more for each 2 prism diopters of exophoria in excess of six.

The last habitual phoria amounted to 10 prism diopters, this would call for a lag of .75 D plus nearly .75 more or 1.50 D altogether. The finding in dynamic retinoscopy is +2.00 D. When the amount of the lag accommodation is deducted from this, the remainder is only .50 D.

Now we accept it as a fact, that normally, all of the retinoscope findings and the disassociated crossed cylinder finding must be equal to the subjective. If not that fact is indicative of strain somewhere in the ocular mechanism.

With the retinoscope used at 16 inches dynamically we obtained a gross finding of two diopters and a net finding of one-half diopter which is much lower than the subjective. In using dynamic retinoscopy the eyes are reading letters at 16 inches for which they must use 2.50 D of accommodation. How then is it possible that they can see to read at all? The reason is that the brain demands that they see, so, in order to accomplish it, a defense mechanism is set up, in other words, by reflex, extra amounts of nervous energy are sent to the adductor muscles to force the accommodation.

Did not we learn in a recent finding by means of fractions that the fatigue effort was in the adductors? We have measured the amount of accommodation used by these eyes under disassociation or independent of any interference of adduction, found them using 2.50 D and causing an induced phoria of 10 prism diopters or 6 more than under the +1.00 D subjective finding.

Very well, we next must know what these eyes do under a binocular state, with the adduction free to do as it will. The disassociating prism is removed but the crossed cylinders are left in place. Our findings now are +2.00 D instead of +2.50 D spheres and the induced phoria is decreased from 10 to 6 prism diopters.

Thus we have measured the association of accommodation and adduction in almost every conceivable way and have learned that when the accommodation is so blocked that no more or less amount than the least amount necessary to see at 16 inches is used, it just has to use more power than it ordinarily wants to when the crossed cylinder is removed. Then when adduction is freed to help it some the finding is decreased. Likewise when the adducting power when freed of carrying accommodation it shows its relief by the increased exophoria.

There are three things that may be the cause of discomfort in the visual economy of the eyes; one may be a toxic condition which insulates the normal flow of nerve energy to the muscles causing a toric esophoria; another is when the nerve centers cannot supply a sufficient amount of nervous energy to the cilliary muscles to maintain the function of accommodation; and another when there is an insufficient supply of nervous energy to the adducting function.

Under all of these conditions the visual centers demand clear single binocular vision, and, because they cannot get it through the intended channels of the Brain Pattern, obtains it as near as possible by altering the Brain Pattern. Now if this altered arrangement of the flow of nervous energy is allowed to continue very long strain, discomfort and distress are experienced.

It is a reasonable conclusion, then, that if any one of the above conditions exists it follows that there will be a number of findings that will point out in just what function the basic insufficiency lies and definite proof will be determined in a sequence of symptomatic findings. This grouping of symptomatic findings is called a chain of findings in the 18 point examination.

But now to finish with our case. Our next logical interest is the adduction and abduction at near. These ductions tell us the amounts of nervous energy reserve which each function possesses to prevent the eyes from seeing double. The recovery which is taken in each case is a barometer to inform us, if the "urge to fusion" after stress, is quick and good or slow and weak.

I neglected to state that the patient being only 19 years of age is therefore pre-presbyopic and the near point ductions are taken with only the subjective before the eyes. If, however, the patient were presbyopic these same findings would be taken through the findings obtained with binocular crossed cylinder.

The ductions in this case are found to be 30 base out prism diopters to break and 28 to recovery. The minimum expecteds being 21 prism diopters to break and 15 to recovery. As for the abduction the findings are 22 prism diopters to break and 10 to recovery. The minimum expecteds being 22 prism diopters to break and 18 to recovery. All of them being very good save the recovery in the last one which is very low and slow in its urge to fusion.

There are a few other tests which bring to the wide awake optometrist further enlightenment on the case but we will deal with only one on this already too long paper. This one is the monocular amplitude of accommodation. The minimum expected is about 10 diopters, the finding is only 6.

Continuing the record of the findings to include the nearpoint tests, we have the following:

(m) Habitual phoria at 16 inches—4 prism diopters of exophoria.

(n) Crossed cylinder test, dissassociated O.U. + 2.50 diopter spheres.

(o) Induced phoria under last finding 10 prism diopter exophoria.

(p) Crossed cylinder test binocular O.U.+2.00 diopter spheres.

(q) Induced phoria under last finding 6 prism diopters exophoria.

(r) Adduction under the subjective finding 30 break and 28 recovery.

(s) Abduction under the subjective finding 22 break and 10 recovery.

(t) The amplitude of accommodation taken monocularly is 6 prism diopters.

(u) The vertical phorias and ductions are negative.

The time required by those who train themselves to use this system is not over 45 minutes and human eyes and vision are certainly worth this much care and attention from those who want to best serve the ocular needs of their patients.

Every complaint of eye strain or fatigue experienced in the use of the eyes, has its basic cause either by reason of the presence of a toxic condition or an insufficient supply of nervous energy to either the muscles of the accommodating or adducting functions. And as I have already written two or three times, no one or two of these findings can definitely lead to a right diagnosis but only by a whole series of collaborating symtomic findings.

For instance in the case we have just completed. Notice the two phorias taken at distance—both alike—also the two habitual phorias taken at 16 inches—both alike. Does this mean anything in the diagnosis of the case? Hardly, as I have already explained.

If you inspect the dynamic retinoscope finding at 16 inches, the gross finding of which is O.U. +2.00 diopter spheres and the net only +.50 diopter spheres after the lag of accommodation is deducted, then compare them with the disassociated crossed cylinder findings, you will note quite a difference. Both were taken at 16 inches. The result with the retinoscope finding shows that, because only ½ diopter of nervous energy is actually available to be used by accommodation, the remaining 2.00 diopters, necessary to focus at 16 inches, is obtained through energy sent to the cilliaries through forced efforts of the adductors.

Again looking at the figures recorded for the disassociated crossed cylinder and the phoria induced by the stronger spheres you will recall the two fractions, indicative of the inhibited ration and therefore the excess effort put forth by the functions of accommodation and adduction when unhindered by any lens. These fractions showed that the ratio between the two was 3/5 for accommodation as against 2/3 for adduction, thus again showing that the greater strain is in the adductors.

Reviewing other findings that do not come up to their minimum expecteds, after the induced phoria, we come to the true adduction. This we find too low so that there is too close an association between the activities of adduction and accommodation. The next finding that does not make a sufficient showing—the recovery point in abduction. The reading reveals a slow and low recovery which is caused by the fatiguing effect caused by the excessive effort used by the adductors in doing their own job and at the same time assisting or forcing accommodation.

Glancing at the corresponding abduction for close work we can see how the same condition prevails.

Diagnosing our case then we approach with confidence the finding that this case is one of an insufficient supply of nervous energy to the cilliary muscles or muscles of accommodation. In part we came to this conclusion by prescribing O.U.+1.00 diopter spheres but these did not give complete relief. We then found that the trouble was deeper seated as proved by properly using the findings of the dynamic retinoscope and the disassociated and binocular crossed cylinders and corroborated by the phoria findings; the duction findings while the low amplitude of accommodation places its findings in final proof.

DR. LOUIS L. DE MARS
WILMAC BUILDING
MINNEAPOLIS, MINN.

# THE TREATMENT OF SQUINT CASES*

J. I. Kurtz, B.S.A.O., F.A.A.O.
Minneapolis, Minn.

Some optometrists attempt to give orthoptic treatments to squint cases and, failing to get satisfactory results, become discouraged and quit without even making an attempt to trace the cause of their failure. Action of this kind on the part of any optometrist merely indicates that he was not properly prepared to enter this highly specialized field.

Before a case of squint is accepted for treatment one must have certain definite information about the case in order to determine whether or not the particular case in question is one that will yield to oculo-prism treatments. The points the optometrist should take into consideration in selecting his squint cases for treatment are:

1. Age
2. Degree of squint
3. Visual acuity
4. Possible excursion of the squinting eye
5. Degree of suppression or suspension
6. Possible cooperation from parents
7. Cooperation from the patient
8. Skill of the Operator
9. Temperament
10. Equipment

1. At what age shall one attempt to treat a strabismic case? There is no definite agreement upon this important point. Worth and other authorities believe that treatment should be started at a very early age and that the chances for success diminish as the child passes the age of six or seven years. Personally I have found clinically that this age limit is way too low. I find that some cases ranging in age from twenty to thirty years will yield to treatment. While this age limit may seem too high, my attention was recently called to the fact that the French eye specialists Cantonnet and Filliozat[1] claim that they set the age limit not lower than seven and not higher than thirty-five or thirty-eight. There is very little cooperation one need expect in any type of subjective treatment from a very young child. One should not expect very much assist-

*An abridgment of the material presented before the Minnesota Academy of Optometry at Minneapolis, September 22, 1935.

ance and cooperation on any subjective treatment technic from a child under five. It is different however, when one uses objective methods.

2. The degree of squint. One must not expect that all cases of squint will yield to treatment. While we do not have reliable statistics on this subject it is safe to assume that between 25 to 35 per cent of all squint cases will not yield to any sort of treatment. Hall[2] contends that only from 35 to 40 per cent of all squint cases will yield to non-operative treatment. We believe that here Hall errs in being too conservative because in the same article he reports that of 205 squint cases 187 were definitely successful and 18 were definitely unsuccessful. No matter what the correct percentage of cases that yield to treatment may be it is well to keep in mind that in squint cases under 50 prism diopters we have a better chance for success than when the amount is higher than 50 prism diopters.

3. Visual Acuity. Amblyopia is frequently found in squint cases although not necessarily, when it is found the first attempt should be made to improve the visual acuity of the amblyopic eye. If the degree of amblyopia is very great, especially if it is congenital, the chances for improvement are not very promising.

4. Movement of the Squinting Eye. It is important to measure on the perimeter or any other similar instrument the excursion of each eye separately, inwards and outwards. A limitation of excursion in any direction may be an indication of the presence of adhesions, tendinous retractions, paresis or paralesis. In either case, oculo-prism treatment will be of no help in view of the fact that the affected muscle will not be able to participate and perform its share of work in the task of binocular vision.

5. Degree of Suppression or Suspension. If the squinting patient sees two images when placed in front of a strong light, that is, if he has diplopia from the very beginning then the chances for improvement are much greater than if one image is completely suppressed. This does not mean that the prognosis is definitely unfavorable, it simply indicates that the task of accomplishing binocular vision is more difficult, and that some time will have to be spent to overcome the condition of suspenopsia.

6. Cooperation from Parents. If the squinting patient is a child, much of the success will depend upon the degree of cooperation the parents are willing to give to the optometrist. The keeping of appointments regularly and following out instructions regarding occlusion and other home treatments is of great importance, and if the complete cooperation of the parents can not be had then one can not expect to get the best results.

7. Cooperation from the patient. In order to get the best results it is important to have not only the cooperation of the subject by coming regularly for the treatments, but it is even more important that the subject has the *will* and desire to have his deformity corrected. An

eminent physician once made the statement: "I am always sure that my patient will get cured if he *wills* with all his strength to get well." This is especially true in the treatment of squint. The more the patient wills and desires to get his eyes straightened the better will be the results. That is why in some cases the results are better with patients sixteen to eighteen years of age than with children five or six years old. I fully realize that this statement is not in agreement with Dr. Worth who contends that to get the best results in squint cases treatment should be started before the child is six years old, however, from clinical experience we find it is possible to get better results in adults than in very young children.

8. Skill of the operator. If all the preceding points discussed are favorable one need not expect to get good results unless he has a thorough knowledge of the subject of squint, know all the different technics to be applied in the treatment of squint and when to apply some technics and when to apply others. There is no fast rule about what technic is to be used in a specific case. One technic may prove very successful in one case and may not be of any help in another, yet similar case. Here is where the skill and ingenuity of the operator enters. The more he knows about the subject the greater are his chances for success.

9. Temperament. The temperament of both the patient and the optometrist are important elements. The treatment of squint is a difficult and tedious task and it is very important that the optomerist by temperament be equal to the task. He must know from the very beginning that many obstacles will be found during the treatment period, and some of these will be difficult to overcome. He must not get discouraged himself, nor let his subject become discouraged. If his interest in the case begins to lag, the subject's interest will lag even more. His subject may at first not be able to do things he expects him to do, or he may not understand what is expected of him. This calls for patience, tact, kindness and sympathetic understanding. One who possesses these attributes will have no difficulty in keeping up the patient's interest in his work no matter how long it takes before results are obtained.

10. Equipment. The last but not the least we must mention equipment. To treat squint successfully one should have the proper type of equipment. I am afraid that some of you will be disappointed when I tell you that you do not need very much equipment in order to be successful in your treatment of squint. You need not own every treatment instrument now available. There are by far too many instruments, which in principle at least, are duplications of one another and if you have one of them you need not worry about the rest of that type. There is a minimum however that I would suggest, namely:

1. Amblyoscope
2. Stereoscope and cards
3. Phoropter, Kratometer or Refractor
4. Cheiroscope or other similar instruments

5. A Clayson visual acuity meter, a projecto-chart or any similar modern test chart

6. Some version exercising devise.

Any optometrist having the proper equipment and sufficient training and who selects his squint cases for treatment with care, is bound to get successful results in a considerable percentage of cases.

BIBLIOGRAPHY

(1) Cantonnet and Filliozat, Strabismus. 1934.

(2) R. N. Hall, Non Operative Treatment of Strabismus. American Journal of Optometry, August, 1934.

DR. J. I. KURTZ
1502 FOSHAY TOWER
MINNEAPOLIS, MINN.

# A BASIC TECHNIQUE IN ORTHOPTICS*

## PART III

William Smith, Opt.D.
Roxbury, Mass.

In two earlier articles under similar title I discussed at length techniques in the training of amblyopia-ex-anopsia[1] and strabismus.[2] Cases were cited, and programs outlined for their handling. I am emphasizing rather strenuously the importance of a prearranged plan of operation and procedure in the handling of orthoptic cases. Helter-skelter methods spell failure. Recording, comparing, checking and cross-checking merely indicate that the man behind the orthoptic instrument knows what he is doing. It is not the instrument that is producing results. It is the man in back of it. Of course, I am not minimizing the necessity of proper equipment. That is obvious. But with equipment there must be added a most essential factor—mental equipment and resourcefulness.

No branch of optometry calls for as much resourcefulness as does orthoptics. An optometrist who possesses that faculty can accomplish more with an ordinary pencil than one lacking it, can do with high-priced instruments. Understanding the case, and handling it according to a prearranged plan and by keeping a treatment by treatment account is only one part of the technique. But with it comes a certain knack for handling orthoptic cases and doing for them that which would ameliorate conditions existing.

Amblyopia-ex-anopsia being prevalent in all types of strabismus except the true alternating, presents a problem of no mean importance. It has been my procedure to attempt to raise the visual acuity as high as possible, as the first step in the correction. Numerous methods are available. Many are too tedious for both the optometrist and the patient and not much progress is realized. Others are successful in the training of some types of cases while they produce no progress worth while in others. It has been my concern to devise a universal method whereby, at least,

---

*Submitted for publication August 13, 1935.

[1]William Smith. A Basic Technique in Orthoptics. Part I. Amer. Jour. of Optom., Vol. 12, No. 6, pages 224-233, 1935.

[2]William Smith. A Basic Technique in Orthoptics Part II. Amer. Jour. of Optom., Vol. 12, No. 8, pages 321-331, 1935.

all types of amblyopia-ex-anopsia cases would be benefitted. I have experimented with near point reading cards with large letters; with the Snellen test cards using the alternate approach method and with numerous other techniques. I secured a flasher and attached it to a lamp, had light flashed into the amplyopic eye at intervals. The patient would stand or sit facing the light, the room darkened and the light would go on and off. I found that this method was highly stimulating and continued to use it in all amblyopia cases. I modified this by having the light flashed on and off on a Snellen chart, the patient pointing out letters seen as they became illuminated. This helped in the development of projection as well as in visual acuity. After a while I began to experiment with concentrated light and the results proved to be better than anticipated. With the help of some corrugated cardboard and later on by using a tin can, I rigged up an apparatus by the use of which retinal stimulation is most successfully handled. This apparatus permits the use of color filters, letters, pinholes and other objects in the course of retinal stimulation and enhances the procedure.

Light flashing is an old technique in the training of amblyopia-ex-anopsia. But, like many another technique, it was carried out in an inconsistent and unscientific manner. To begin with, a dark room was essential when light was flashed into an eye and the patient was experiencing alternatingly periods of light and darkness. A great deal of the light was being lost and the retina didn't receive the benefit from it. White light only could be flashed into an eye and the position of the patient was not always the same. This all has been eliminated by the use of the retinal stimulator. Furthermore, added means are available which further enhance the value of light stimulation. This I have already mentioned.

In my previous articles I mentioned that I am using the Keystone Telebinocular for my work in orthoptics both at the office and at the hospital. Those who are familiar with that instrument will readily visualize my technique in retinal stimulation with the stimulator.

My newest model stimulator can be attached to the telebinocular head, thus enabling the light to be projected into the patient's eyes in a lighted room. I made a minor change in the telebinocular head by inserting a small nut between the screws of the outer plate and thus leaving a space into which various color filters, blanks and other forms of supplementary objects used in retinal stimulation may be inserted. The patient is looking into the telebinocular tubes and the light keeps flashing into his eye or eyes at regular intervals. Macular fixation is more accurate and the entire central area of the retina is stimulated at one time. The lenses in the telebinocular head in no way affect the stimulation with the instrument, but if accommodative stimulation and action on the iris is desired, a minus five lens may be placed over the instrument lenses, thus neutralizing them.

I have been experimenting with color filters for retinal stimulation and have learned from limited observation that certain types of amblyopes respond variably to different types of stimulators. The colors used are red, blue, green, violet and yellow. I obtained samples of fibreloid from the Fiberloid Corporation of America and am using these experimentally to determine which colors would be best suited for different types of cases. I have noticed that Fiberloid No. 2137 amber (yellow), .010 inch thickness, used with the retinal stimulator, causes intense response in the retina. The eye "feels" it more than it does red, either the same or .012½ inch thickness. This I tried in several instances, in high amblyopia-ex-anopsia, vision 10/200, of hyperopic types. The response was least when green and blue filters were used. Red followed amber (yellow) in intensity. I haven't sufficient data available for definite conclusion, but following the methods chosen for this experimentation, more conclusive data should be available in due time. By filtering out and utilizing single colors from the visible spectrum, I have hopes of finding a quicker and more effective and efficient method for developing amblyopic eyes.

Mr. Anapolle, one of my assistants at the clinic, and a third year optometry school student, is responsible for a variation in the colored light stimulation technique, which is proving to be highly effective. Instead of covering up the non-stimulated eye, Mr. Anapolle left it open and inserted in front of it a card of similar color as the filter. On the card is drawn in black a circle or a cross and is illuminated indirectly. Each time the stimulator flashes on, the patient sees two objects. In front of the eye which is being stimulated he sees an electric bulb colored according to the color filter. In front of the other eye appears the colored card with the object drawn on it. After a while, and especially when there is beginning to be felt a response to fusion development, the two images superimpose and the patient may see a colored electric bulb with a black cross or circle in the center or near the center. This method is most useful in cases of amblyopia which have reached the stage where letters are recognized more readily. We start using it when the amblyopic eye has reached 20/200 vision. It is not advisable, however, to give this method of training exclusively. The amblyopic patient not being familiar with the act of co-ordinate vision becomes confused when this exercise is introduced and loses all sense of projection. At the start it is best to give retinal stimulation to the affected eye only and give the double stimulation as supplementary and then only for a short time. The lettering on the electric bulb in the stimulator is an excellent target and the patient should be encouraged to read them whenever possible. Training amblyopic eyes to see is a tedious job and calls for a great deal of ingenuity on part of the optometrist. It must be remembered that amblyopic eyes are eyes which haven't been seeing and any amount of strain fatigues them easily. It is observed, however, that as the eye becomes stronger its efficiency increases. It doesn't fatigue as easily and it

can stand considerable use.

Mr. B. L., whose case I cited in an earlier article, and whose visual acuity, both with and without correction is 1/200 in the left eye, presented quite a problem. It appeared at the start that the boy had a suppression area in the nasal part of his retina and this retarded progress. His visual acuity was increased 20/200 after two weeks of training and to 20/100— after six weeks. But the boy was not making the progress anticipated and I wanted to know the reason for it. His form and color fields appeared normal and he has normal fundi and media. By using a half degree perimeter target and a sheet of white paper with the telebinocular as the instrument, I succeeded in charting the limits of the suppression area and am using it for comparative purposes during the training period. The suppression area is charted in the same manner as the blind spot and its limits marked. It is not necessary to give the area mathematical notation, albeit it may be done, if the optometrist so desires. A white target is used exclusively.

I am still devoting the training periods for the elimination of B. L.'s amblyopia and have noticed progress. Projection is becoming normal. He is able to recognize small newspaper type and can pick out letters with considerable ease. Tracing on the correct-eyescope is much easier and more accurate. I am training and reducing the suppression area with the stimulator, using red and yellow filters alternatingly and by using news print and single letters pasted on pieces of cardboard. These cards are being moved over the entire visual field and B. L. is made to pick out the letters and to read them aloud and to trace them. His responses must be accurate, or he is required to do the work over again.

The case of Mrs. R. G., whose record I cited in the second part of this series, is making surprising progress. When first started on May 10, 1935, there was an exortopia which required 30° prism base-in to fuse. At this time, in August, she is fusing with 5° base-in prism effect and is holding single at 0° and 5° base-out. Her eyes become orthophoric at will and remain so for a considerable length of time. By bringing a fixating object nearer to her eyes, Mrs. R. G. converges binocularly about 35° with each eye. There is normal response now in the fusion faculty and she is developing stereopsis.

In training cases such as the last mentioned, my program includes duction as well as fusion exercise, given in sequence. Fusion exercise is first given, starting at the easiest point of fusion, then the amount of prism effect is increased until diplopia occurs. The patient is urged to make an effort to fuse at the new point. If that is impossible, the prism effect is reduced until fusion is obtained; then it is increased again gradually; the process is then repeated. The duction slides, while of similar construction as the fusion slides, are somewhat differently arranged. The calibration is different and the fixation objects are smaller and are more numerous. In duction training the same procedure as in fusion is employed. To insure binocular fixation, the patient is asked to report whether the two

lines, one vertical and one horizontal, which are found on the Keystone cards, or improvised fixation objects, which may be made on the other type cards, are seen. I marked dots under the right and over the left "N" of the "O N N E" cards, which are part of the American Optical Company Wells chart set. This can be done with all the other cards. The dots serve as a check for suppression and binocular fixation.

While exercising duction and fusion, I am also educating the patient in the faculty of depth perception. The Keystone split slides are ingeniously adapted for that purpose because the pictures are both flat and stereoscopic on the same card. Stereoscopy, like fusion, must be taught to a patient with strabismus. In heterphorias the faculty is generally present, although in varying degrees.

In treating the case of Mrs. R. G. I am planning to continue exercising both fusion and duction until her easiest point of fusion on the first series of cards reaches the limit on the base-out side. Then a more intricate series will be started, commencing from the easiest point of fusion base-in and carried through, as in the first type of card, to the easiest point base-out fusion. This will be repeated until the most difficult cards of the series are fused and until the fusion amplitude is highly flexible and strengthened. When this step is reached, suppression exercises will begin and the first of the streometric cards introduced. I may start these two procedures earlier, but this is problematical and depends upon the progress made. The reason I am leaving these two treatments for the last is because I believe in getting the eyes and visual apparatus ready to receive impressions unhampered. If suppression will still be prevalent after the fusion amplitude is increased and strengthened, the suppression will have not been directly caused by faulty coordination and the cause is elsewhere. The streometric cards not only measure the amount of stereopsis, but they also help to increase the visual acuity, and perfect fusion. I shall conclude the entire training with the "Shock Duction" slides, of which I have spoken in another article. These slides tend to emulate, as nearly as possible, the patient's visual habits in changing the focus from remote points to those near by. The amount of both convergence and divergence in accomplishing this, can be varied and the range increased. All these exercises tend to develop the new visual habits and make them preferable to the old and accustomed ones.

All the procedures cited and described, can be carried out very effectively with any type of orthoptic instrument and with any set of cards. A prearranged routine is of utmost value, as it gives the orthoptist a plan of operation. And if the case is thoroughly understood and the program prepared on that understanding, successful conclusion usually follows.

In my search for a basic technique in orthoptics, numerous authors have been consulted and their ideas taken into consideration. As I have access to a very large clinic in orthoptics, I am utilizing this privilege in

formulating this technique. The cases that come into this clinic are varied. They are heterophorias, squints, amblyopias, nystagmus and suspenopsias. The ages of the patients likewise vary from extreme youth to middle age. Our youngest patient is three years old. The techniques used in the training vary according to the condition, duration and extent. The preliminary examination is usually made by one of the assistants and then the program is mapped out. Frequently the entire program is laid out; in some cases only part. All the cases are carefully watched and their progress inquired into, and changes made when necessary.

Very young children, that is, children under the ages of five or six, present a problem of considerable difficulty to the orthoptist. A routine examination into the muscle problem is impossible and all data must be secured from observation and the case history. The prescription, if such is indicated, may be arrived at by dynamic skiametry, but the prescription for orthoptic training, while followed along accepted methods of procedure, can often not be carried out along those lines. Resourcefulness on part of the operator is invaluable. To begin with, he must gain the confidence of the child and shake off its fear of the doctor and his instruments. The entire procedure, therefore, is turned into a game which is played by the child and the doctor. This is carried out until the child becomes accustomed to the office atmosphere and understands the doctor.

R. W., three years old, has what appears to be an alternating esotropia. An earlier examination done at the age of two, disclosed a left convergent squint without alternation. The child was prescribed at that time a compound prescription, of almost similar formula in each eye. This was prescribed from the retinoscope, under atropine. She was brought back for re-examination.

The correction found at this time differed but slightly from the one the child has been wearing and she was referred to the orthoptic clinic. A cursory examination revealed an alternating esotropia with a dominancy in the right eye. While the child was co-operative and didn't show signs of fear, it appeared futile to put her on the regular routine, as nothing would be gained by such a procedure. The child was too young to understand what was expected of her. The routine decided upon, therefore, had to be consistent with the child's intelligence and its scope of understanding. She was put on the hand stereoscope and pictures with base-in and base-out effect placed in the holder. Each eye is alternately covered and uncovered, the monocular exposure being done rhythmically, so as to create a normal adaptation and fixation. At first the operator points out the entire picture to each eye. This is followed by naming various objects which appear on the card. After a while when the child becomes oriented to the surroundings and accustomed to the routine, she will be asked to point out the objects on the pictures. This technique will be followed until monocular fixation is established and until the child shows an aptitude and readiness for a more intricate method of training. This

system will help to establish higher acuitness of vision. At the present time her visual acuity is questionable and if there is an amblyopia, that we do not know. The routine decided upon, therefore, will afford us a method of watching the case and to note any signs which may give us clues as to the existing anomaly besides the one seen externally.

False alternating strabismus constitutes a perplexing problem. It is noticed frequently that an alternation will develop in conditions which originally were noted as monolateral. The condition is a false one, it is conceded, but what is causing that and what is it? It is noticed in both, uncorrected strabismus and in cases which are being trained. In the latter type the alternation may appear when the fusion faculty is becoming apparent. In the former, when the optical correction becomes inadequate. The explanation for this occurrence may be in the discrepancy and probable dissimilarity of the retinal images caused by retinal rivalry and confusion. The effect may disappear when the visual correction is changed and when the fusion faculty is strengthened and streopsis definitely established. The true alternating strabismus seldom responds to this regimen.

Mr. T., nineteen years old, has been wearing correction for many years. He has convergent strabismus with a periodic alternation, which became more apparent and more fixed within the past six months. A change of correction, giving him somewhat of a blur because of overcorrection in the plus spherical element—the plus cylinder being the same as formerly—didn't affect the muscular condition. His visual acuity was approximately 20/40 in the right and 20/30 in the left eye with the new correction. It was approximately the same with the old correction, although there was a considerable increase in the spheres of both eyes. Without correction his visual acuity was not definitely established.

Mr. T. was put on orthoptic exercises and visual acuity training was commenced. The retinal stimulator was employed and his vision brought up to 20/20 in each eye. Base-out fusion and duction training followed retinal development. Base-out prism effect had to be instituted as that was his easiest point of fusion. Base-in effect is the objective and will be commenced as soon as he overcomes the other. In addition to retinal stimulation with light, various other visual acuity cards were used for training. Rhythmical monocular fixation is part of the program and is given at each training period. Mr. T. is also given version and rotation exercise both on cards and by manual methods. An ordinary pencil is employed for that purpose and Mr. T. instructed to follow the object. Base-in prisms are placed in a trial frame and these utilized in the rotating exercises. The prisms used are of high power.

At this writing, Mr. T.'s eyes appear almost orthophoric. The alternation is definitely alleviated. He is beginning to fuse and to show a feeling for depth perception. His visual acuity is 20/20 in each eye. Base-in exercises will be continued until all the cards are mastered. Duction training will be supplemented and stereopsis trained. The one favor-

able feature of this case is that the patient was extremely sensitive of his cross-eye condition and is highly co-operative.

I have seen clinically a condition similar to the one cited above which responded to optical correction. The boy, 5½ years old, is both deaf and dumb. His mother noticed the eyes turning inward, alternatingly. The boy was taken to a hospital and there prescribed under atropine, O. U. plus 2.50 D. Sph. For a short period after the glasses were given, the boy's eyes appeared straight. But when the boy entered school, some time later, his mother noticed the old condition recurring.

I therefore prescribed:
O. D. + 2.00 D. Sph. ⌒ + 0.75 D. Cyl. axis 165. = V. A. 20/20?
O. S. + 2.25 D. Sph. ⌒ + 0.75 D. Cyl. axis 15. = V. A. 20/20?
and advised orthoptic training to start as soon as the boy understands sufficiently how to co-operate. In the meantime I keep watch over the boy's eyes. The alternation hasn't occurred again since the last examination in February. This case appears to be one of optical etiology. There appears to be fusion. The boy was asked to define fusion cards and his responses indicated that. However, in view of the existing handicaps, orthoptic training, if such is to be given, will be postponed until such a time that the patient is fully aware of what to do.

Observation leads me to believe that the cause for the "false alternation" is purely optical. The condition changes when adequate optical correction is worn. The alternation becomes monolateral, and fixed. Training of such eyes is comparatively a simple matter and they respond quite frequently, if the proper methods are employed.

Confidence in one's own ability is an essential factor toward success, but in the practice of orthoptics it is invaluable. Self-reliance and self-assurance, imparted to the patient by the optometrist, by his manner of performance, do more toward the success of a case than the knowledge of a lot of theory. The successful orthoptist must be, first of all, a practical man. If, in addition to his practical experience he finds time to delve into the realm of theory, he is in a position to expound his knowledge for the benefit of all. The negative element has no place in the practical application of orthoptics. The orthoptist's field is the field of abnormal psychology and he must therefore be familiar with his subject-matter. The patient must always be encouraged and his slow progress, or temporary cessation of it, explained in encouraging terms, and in an optimistic manner. Of course, the orthoptist should use discretion in this matter and avoid building up false hopes. But if a case has any reasonable outlook of successful completion, encouragement should be given and hopes held high. All this can be done in an unassuming manner so that the patient wouldn't expect too much and yet be hopeful. Tact and diplomacy must be exercised.

DR. WILLIAM SMITH,
260 SEAVER STREET,
ROXBURY, MASS.

# AMERICAN JOURNAL OF OPTOMETRY

Vol. 12 OCTOBER, 1935 No. 10



EDITORS

DR. CAREL C. KOCH
1501 Foshay Tower
821 Marquette Avenue
Minneapolis, Minn.

DR. JACK I. KURTZ
1501 Foshay Tower
821 Marquette Avenue
Minneapolis, Minn.



Original papers, scientific communications, clinical reports, society proceedings, books for review, and correspondence should be sent to the Editor, Dr. Carel C. Koch.

Annual Subscription, $4.00 in Advance, Canada and Foreign, $5.00.
Single Copies, 40c.

Copy of advertisements must be sent in by the tenth of the month preceding their appearance. Subscriptions, applications for single copies, communications with reference to advertising or other business should be addressed to the Business Manager, Dr. Jack I. Kurtz, 1501 Foshay Tower, Minneapolis, Minn.

Published Monthly by the
American Journal of Optometry Publishing Association.



The Journal has no objection to the reprinting by other magazines of any of its articles, provided such reprints are properly credited to the Amerian Journal of Optometry.


## OPTOMETRIC INVESTMENT IN EQUIPMENT

One can develop no universal rule as to how much an optometrist should invest in equipment. In general terms, he should invest enough to keep him abreast of the newest tendencies, and permit him to serve his patients in the most effective manner feasible. Sometimes young optometrists with limited incomes find it necessary to acquire equipment slowly as funds become available. This is natural and nothing else should be permitted to interfere with this program until it has been achieved.

There are two objectives in equipping an optometrist's office. The first is professional and has to do with heightening his efficiency and effectiveness. The second entails showmanship. An attractive office in good taste will impress patients even though the reasoning of laymen in this direction is logically fallacious. A fine array of new instruments and an intelligent selection of ocular and optometric books will also create the impression in the minds of the patients that the optometrist is progressive and worthy of confidence. The slovenly optometrist, who works in a dingy office with archaic equipment and obsolete instruments, may be touched with the gift of genius, but the average layman will not believe it.

An optometrist will, of course, never be completely finished with his own office needs, for newer and better instruments progressively become available. Moreover, furniture and other equipment gradually wears out and needs to be replaced. Optometrists who keep their books scientifically will write off about 10 per cent a year for depreciation of office equipment.

As I write on things optometric, I am moved to discuss this homely question in optometric finance because an intimate student of the profession has written me: "It might be a good idea to take up the question of what amount should be invested in equipment. It is a curious fact that the majority of optometrists will invest from $5000 to $6000 in education and start out with about $200 worth of second hand equipment. An optometrist's equipment includes not only the actual instruments with which he works, but also the rugs on his floors and the pictures on his walls."

Optometrists should not be oblivious to the new cult of beauty which has been developing in American business. With the rising standard of living, the public is no longer satisfied with efficient plainness. Henry Ford, who represented a different school of thought, eventually had to discard his ugly Model T and substitute for it his attractive Model A, which has won widespread consumer favor. Banks, stores and offices throughout the country have been remaking their physical quarters in conformity with new standards of beauty. Professional men cannot and in many instances have not undertaken to resist the tide. The construction of beautiful buildings in many cities is part of the new groping for artistry as well as utility in the workaday world. The individual optometrist should recognize that to keep in step he now needs a better appearing office than that which the old fashioned optician had.

Parenthetically, it would be lamentable if these considerations were over-stressed. The optometrist should analyze his economic problems clearly, work out solutions, and then push these questions into the background. His chief energy and talents should be devoted to the practice of optometry—not to interior decorating. But my belief is that if this collateral or sideline activity is correctly analyzed and handled, it will leave the optometrist freer to concentrate on his professional activities than if he drifts and fails to arrange his material office affairs satisfactorily. It is no more feasible to dogmatize how much an optometrist should pay for office equipment than for an automobile. As a matter of fact, his income will largely condition his decision. A man with a Ford income is unlikely to pick out a Rolls Royce. Interior decorators and makers of ophthalmic diagnostic equipment have estimated that a minimum budget for adequately furnishing the office of an optometrist should be from $2,000 to $2,500. This would include a phoroptor, a test chart, mirror, ophthalmometer, retinoscope, ophthalmoscope, perimeter and one of the numerous devices used in orthoptic treatment work. It would also include modest furniture and rug for the reception room and

several small pieces of office furniture, such as an inexpensive desk, chair, typewriter, table and metal file. These things should not be purchased on an extravagant scale until the optometrist has bought an adequate supply of the necessary instruments of his profession. A fine collection of instruments not only heighten efficiency of operation, but also psychologically inspires the user to do better work.

In deciding how much he can afford, the optometrist must go back to fundamentals and recognize what an overwhelming proportion of his total income comes from his own professional efforts and what a small proportion consists of unearned income from outside sources. An optometrist earning $5000 a year would have a capital value of $100,000. In other words, it would take $100,000 in high grade securities to equal the income which he gets from his own profession. The assets which produce the optometrist's income are mainly intangible, consisting of his native intelligence, his talent for optometry, his professional personality and his contacts. These intangibles have great intrinsic worth which a wise optometrist should enhance with suitable office equipment and supplies.

According to my observation, the trend is toward better equipped professional offices, especially in the smaller cities. Optometric specialists throughout the East, the Central West and on the West Coast have offices which are on a par with any professionals in their respective centers. Some may think that in such cases showmanship and the sense of luxuriousness are overdone. From a social standpoint, these examples of elegance may be excessive, but from a strictly financial viewpoint, this is not necessarily so, as the ratio of investment in office equipment in these offices to annual income may in fact be smaller than that of the commercial man with his high fixed charges of overhead. C. C. K.

* * * * *

## SPECIAL REPORT

## SUGGESTION FOR ADEQUATE OPTOMETRIC EXTENSION*

James O. Baxter, Jr., Opt.D.
New Bern, N. C.

Any profession dealing with the human body or any of its separate organs or functions must be anchored solidly in the basic sciences, these being primarily general anatomy, general physiology, general pathology, organic, physiologic and bio-chemistry, as well as bio-physics, physical,

* Submitted for publication August 10, 1935, with the following comment: "Enclosed are a few observations and suggestions concerning optometric extension courses. The observations are based upon contact with optometrists over three states, North Carolina, South Carolina and Georgia, for a period covering the last five years. The suggestions are derived from actual teaching experience in Chemistry in the Penn-

glandular and medicinal therapeutics. Secondary requisite sciences for the optometrist are ocular anatomy, physiology and pathology, visual optics and sight testing, orthoptic procedures, physical, physiologic and theoretic optics, and, applied psychology. All of the above and several unnamed subjects are herein considered as fundamental or basic sciences.

The writer is not offering up a theory as to "what is wrong with optometry," and objects to any destructive criticism that is not tempered with a practical solution for the alleged "what is wrong."

It does seem, however, apparent that the rank and file of any representative cross-section of optometric practicioners today, who have practised, say, ten or more years (as well as many, many recent graduates), are frequently in ignorance of some of the basic sciences, numerous representative men even questioning the importance of *all* general science that does not have a direct and immediate relation to sight testing, orthoptics or frame fitting, some even contending that *one* of these latter phases of the work is all-important.

We hold the fallacy of the above opinions to be self-evident, if for no other reason than that virtually all medical eye specialists are first trained in general sciences, and these are the men that, despite the indignation of the optometrists, manage to do a class of work that averages up very well, even when they do not properly consider those phases of the work which we consider to be so vital. The reason they manage so well is that they are well trained generally, and hence can solve specific problems in optics in a satisfactory manner. Medical men, for quite a number of years past have, in spite of our ranting over medicine being an art and not a science, kept their feet firmly fixed in such basic sciences as have the remotest bearing on their general problems. Their successes in practice are largely due to this basic training, their failures often due to

---

sylvania State College of Optometry and from knowledge of the problems of various technical and undergraduate students in Columbia University, the University of North Carolina and Penn State, also from contact with students and graduates of the I. C. S. courses in Scranton, Pa. The success of this latter group has always been a source of amazement to me, considering the lack of heavy laboratory equipment suffered by home students in general for such subjects that require them.

"The answer to the profession's need of further basic training lies, I believe, in comprehensive extension work of this type, carried on by a large portion of the group for such time as is necessary to enable us to carry on advanced research efficiently.

"If the same enthusiasm can be aroused over a course of this type as has been aroused over the Skeffington "Foundation Clinic," it is conceivable that we might literally lift ourselves by our bootstraps and place the profession on a plane with other and more adequately trained groups, thereby gaining the same recognition and respect from the lay public.

"Certainly no single individual could conceivably do more than direct the general policy of such an extension course: the administration of the individual courses would of necessity be carried on by recognized specialists in each subject. My reason for mentioning Penn State as the institution to carry out this work is that that is the only institution of which I am aware which makes a serious effort to train its undergraduates thoroughly in the basic sciences. I personally regard this sort of training as absolutely essential for the critical attitude necessary for the successful professional man."

JAMES O. BAXTER, JR.

their ignoring that which they have been taught and endeavoring to make an art of that which must, in the final analysis, be practiced as a science.

Of the optometrist, we can only say that he should be even more dependant upon his knowledge of the basic sciences than the medical man, in that empiricism is less adapted to proper optometric practice than to medicine.

*No optometrist who is incapable of diagnosing all general ocular pathologic conditions and knows what is known concerning their probable etiologies should be allowed to practice except under the supervision of an optometrist who does.* The fact that we may not practice limited phases of medicine after we have mastered it is entirely beside the point; *we are unsafe practicioners and a menace to public health until such time as we are informed in every science pertaining to our work.* Once we have, as a profession learned our primary sciences and their applications, it will be absurdly simple to change our laws to allow us to practice what we then know. Legislative action in our present lamentable state of ignorance, is, to state it mildly, premature.

In order to properly and fully understand any ocular pathology it is necessary to know and understand general pathologic anomalies, hence general pathology. In order to understand general pathology it is necessary to fully comprehend general physiology and have a very thorough knowledge of general anatomy. Again, the study of physiology assumes a thorough comprehension of the several chemistries, and more than a rudimentary knowledge of physics as well.

Present day efforts to teach advanced optometric procedures to the rank and file of practicioners resemble the actions of an architect who builds the dome and super-structure of an edifice first, assuming that the foundation has been taken care of. It is obvious that "knowledge" so acquired is without foundation; it is of vastly more importance that the individual recepient of such material is not in a position to accurately judge the merits or value of new material due to his lack of knowledge of the basic laws governing the underlying sciences, and it is often apparent that free-lance "teachers" of various procedures and "isms" themselves lack basic education. It has been said that there is no royal road to learning; there isn't. Neither is there any known method of mastering the calculus without first being proficient in arithmetic and algebra.

It seems apparent that mastery of the various sciences mentioned could hardly be obtained without aid from some source; certainly only the rare and gifted individual could master the fundamental subjects taught in the first two years of medicine, and even he only with an enormous waste of time and misdirection of effort.

What is needed is an adequate home study extension course *for the licensed optometrist only,* presenting the required courses in logical sequence, with definite assignments divided into lessons and supervised examinations at the end of each sub-course, in the manner of University

Extension. This should be supplemented by yearly attendance for a minimum of two weeks in the clinics and laboratories of the institution offering the course, for the purpose of acquainting the graduate student with improved clinical methods, fundamental laboratory techniques and methods, and to allow the instructors to assist in clearing up any misconceptions which the student may have acquired during the year. Brief but comprehensive examinations could be given at this time in order to show the student where he should devote the most of his time.

Such a course should require for from one to five years for completion, supposing that three or more hours a day would be devoted to home study, the total time required depending upon the needs of the individual.

By briefly reviewing, at the start of the course, such elementary subjects that the student would be supposedly competent in, and supplementing with further study where necessary, the student would never be presented with work beyond his comprehension, and would hence avoid that most serious discouragement that the home student is confronted with: lack of prerequisite subjects.

Completion of the full course should be followed by recognition from the institution in the form of a master's degree or a fellowship.

To develop such a course and make it effective would certainly entail difficulties, and could only be done properly in a first-class optometric institution.

The objection might be offered that insufficient numbers of serious men could be found to sign up for such a course to make it a practical undertaking. The writer does not believe that this would be the case; we cannot help think of the thousands of students obtaining a very thorough training from an internationally known correspondence school in such diverse subjects as chemistry, electrical, civil and mechanical engineering, architecture, mathematics, accountancy, law, et cetera. This school takes even non-high school graduates and turns them out after intensive training thoroughly competent and able technicians in their chosen work.

The search for optometric knowledge in the profession has been unusual in the past several years; if the effort now being expended were to be properly expended and directed by trained educators, the results would hardly be less than spectacular after several years. We would then have a large group of men with a proper scientific background and outlook, having the all-important critical attitude necessary to the true scientist. This attitude is, we believe, to be obtained only through a comprehensive knowledge of all the underlying sciences forming the base of the profession, and the presence or lack of this attitude constitutes the real difference between the professional man and the merchant.

In the event that a large group of optometrists did so develop themselves, there is little question that the entire profession would be lifted

immeasurably above its present position of quasi-merchants, and the really informed individuals would be in a position head and shoulders above any group that has ever competed against them.

In brief, what we need is a more thorough basic training, to be gained through intensive individual effort, along formal, logical and directed lines, the course of study to be administered by such an established institution as the Pennsylvania State College of Optometry.

No panacea or cure-all is offered or advocated for our professional ills; the fact that the ills are present and retarding in their influence seems obvious; that any individual or group must either progress or be eliminated from the stuggle is recognized. Past efforts to relieve our troubles have been misdirected, often with the view of personal profit foremost in the mind of the teachers; they have been feeble, and that they are without apparent results is a nightmare to the man who has to continually explain what he is and what he does.

*No technical profession can continue to exist without research; there can be no research without basic science if it is to be of lasting importance.* This we hold to be axiomatic.

Are the individuals composing the optometric group big enough to admit their weaknesses, strong enough to strengthen their present poorly designed technical edifice? This writer believes so: we have seen men throughout year after year of painful, laborious effort learn the things they considered necessary for their advancement. We have also heard them lament their deficiencies, which they recognized; lament their lack of opportunity. We have seen them follow fads and "isms" and cure-alls, try them and find them wanting. We have seen them besieged by arm-chair theorists in the technical journals until they were unaware what constituted truth.

It seems opportune at this time to offer the serious group of workers an opportunity to develop themselves and their profession along the lines most likely to insure recognition and success. To offer this group such an opportunity will, we believe, be one of the biggest things that has ever been done for optometry.

DR. JAMES O. BAXTER, JR.,
NEW BERN, N. C.

* * * * *

## MODERN METHODS OF PRACTICE BUILDING*

George C. Jensen, Opt.D.
Saint Paul, Minnesota

In my talk before the Academy last year on "Optometric Economics," I mentioned the progress that Optometry had made in the past 35

*An abridgment of the material presented before the Minnesota Academy of Optometry at Minneapolis, September 22, 1935.

years since the first law was inaugurated in the State of Minnesota. But, after this 35 years of advancement, the problem that faces us today is, "What type of optometric practice should I engage in?" A student out of college is faced with this problem. He, of course, wants to regulate himself and his practice so that he will become economically sound.

In order to do this, he must decide whether he wants to establish himself in an individual practice or establish a commercial practice. The individual practice, in my opinion, offers the best and greatest opportunities for the optometrist to best serve his patients and himself. In the commercial type practice he has greater opportunities for financial gain, if successful, but he is limited in the kind of care that he can give the patients who have intrusted their eyes to his care.

If optometry is going to survive, the profession must, and will, be practiced by individuals, associated in groups, or individual offices, and will have to build a better understanding in the minds of the public; or, in other words, will have to follow along the lines of dentistry in establishing greater numbers of office practices throughout the United States.

After all, public psychology is dependent a great deal upon the way we conduct ourselves. We cannot expect to increase public confidence in our profession if we, on the one hand, will allow the ever-increasing commercial practices to hold out their services to the public as a very simple and easy means of eye care against the individual office practice that really strives to give the individual patient the care that he is rightfully entitled to.

Now, if you have made your decision and have decided to engage in an individual office practice against the commercial practice, you have made the decision for the future that the future should hold out great promises for you. You may not be as big an "operator" as you would if you followed a commercial pursuit, but you will have a greater happiness and satisfaction in knowing that you are rendering a better individual service to each patient you serve.

The modern methods of office practice building in optometry probably do not differ a great deal from other modern methods of office practice building in other professions. That is, a successful dentist or physician must have some means of keeping records, must have some means of building contact with the public, must have some regulated methods that are established in his practice. So must the optometrist regulate his practice along the same general lines. To be successful requires not only knowledge, ability, personality—but location, equipment—all these things are essential to your success.

You can not hope to build these things that make for your success over night, but you can, if you strive in the right direction, build step by step towards an ideal, and that ideal should be to place yourself in the public eye in such a manner that the public who are dependent on your care will have the greatest confidence in your ability. Regulate

yourself accordingly, and have your affairs in such shape that you feel the master of your destiny in your optometric pursuit.

Remember, success is not entirely measured in dollars and cents. Success means much from a financial standpoint, we all agree, but success also is measured in the relative worth that you are to your profession and the worth that you are to your patient public that comes to you for the eye service that you should be fitted to render on a high plane.

Robert Louis Stevenson's definition of success probably is one of the most outstanding definitions of that one long thought of word, and I quote as follows: "He has achieved success who has lived well, laughed often, and loved much; who has gained the respect of intelligent men and the love of little children; who has filled his niche and accomplished his task; who has left the world better than he found it, whether by an improved poppy, a perfect poem, or a rescued soul; who has never lacked appreciation of earth's beauty, or failed to express it; who has always looked for the best in others, and given the best he had; whose life was an inspiration and whose memory is a benediction." Use Robert Louis Stevenson's definition of success and fit it into your own practice and service to your patients. And, as I said before, remember that success is not entirely based on dollars and cents. To be successful, think success; the public largely measures you by what you think of yourself.

When I first engaged in optometric practice some 25 years ago, naturally the equipment that was required in an office practice at that time was not as is required today. One then naturally had very limited equipment while today modern refractive techniques require at least a sufficient equipment to make the diagnostic tests necessary to take care of the public's eyes properly.

Now let me tell you what happens when a patient has decided to come to you for eye care. Of course, this patient doesn't do this on the spur of the moment. This patient, as some do, if he has never had a refractive eye examination before, thinks over this problem for from several yeeks to several years before he decided to go to some "eye man" and have an eye examination. I say "eye man" because the public generally understands that anyone dealing with eyes is an "eye specialist." They do not know that the optometrist is a specialist in his field alone until they have been acquainted with it.

Of course, to be successful in your practice you must acquaint the public with the fact that you are in practice. That, of course, implies that you must have some means, outside of personal contact, of advising the public that you are there to serve them. The type and method of this procedure varies greatly upon the type of practice you have chosen to follow. In a recent report by Dunn & Bradstreet taken from a coast to coast survey of optometrists, twice as many firms reported a net profit as reported a net loss for the year 1933. Interestingly enough, of those who reported a net profit, publicity costs on a percentage basis were nearly twice as high as the average of those who reported a loss. This

seems to indicate that publicity of some sort is a profit-producing factor.

The late Calvin Coolidge, in one of his famous quotations, said, "Nothing in the world can take the place of persistence. Talent will not—nothing is more common than unsuccessful men with talent. Genius will not—unrewarded genius is almost a proverb. Education will not—the world is full of educated derelicts. Persistence and determination alone are omnipotent. The slogan 'Press On' has solved and always will solve the problems of the human race." Remember this, brains do not wear out with work, they rust out with worry. When a man is worrying he is not working; when he is working he will have little time to worry and less reason to worry.

In one of the last interviews granted by Charles W. Eliot at the age of 94, honorary president of Harvard University, he was asked by John B. Kennedy to give a final message to Youth. "Tell them," he said, "if all you can think about is yourself, you are in a bad fix." That means, in terms of helping to make yourself and building your practice —you must think of the other fellow, you must have his interest always at heart. You must forget yourself in taking care of your patient. Remember, his interests are your interests, but his interests are paramount to yours. Forget yourself in taking care of your patient, and remember, your patient is your "king" the moment he enters the door of your office. Gratify his every individual desire to be satisfied and show him you are thinking of him and him alone in the eye problems he has brought to you. But keep uppermost in your mind at all times the worth of your services and remember the world could not long get along with optometric science in some form. It could easily get along after a short period of re-adjustment without the present optometric profession or an optometric profession of the future not radically different from the one of today, but remember that you still would have to have some optometric science of some kind to care for the public's ever-increasing eye demands that present civilized life compels the individual to go through in obtaining his daily bread. Just keep that thought in mind. That helps to build confidence within yourself that you are engaged in one of the most wonderful professions on earth—the profession that enables you to correct vision.

Now you would probably like to know some of the intimate details of my methods of practice building. I have always been a strong believer in the personal letter form of following-up my patients. Ever since the first year of my engaging in practice, I made it a rule that every individual patient should be carefully recorded and follow-up record system should be inaugurated that would carry through to a conclusion the special service rendered this patient. When I say conclusion, I mean that as long as this patient is living there is a continuous service needed to fit his individual case. Early in my practice, I inaugurated a series of follow-up letters and follow-up cards that have been of immeasurable value in holding and building my practice. I feel that anyone engaged in an

optometric practice should adjust his practice along these lines as quickly as possible and employ a competent, careful, efficient secretary and train her to be careful in detail and follow-up procedure. You can not hope to do all this work yourself unless you employ the services of a multigraph company, which in the final analysis, will be almost as expensive as employing a secretary. A competent secretary will pay for her services many times over, and at the same time it takes this load off your mind.

In getting back to my methods of follow-up, I have incorporated what is known as a ten-day to two-week letter, thanking my patients for the opportunity of serving them and asking them if they are entirely satisfied with my services. I then have another letter that is called a "short time follow-up letter" that asks them to return for a new examination in three months or six months, whatever the case requires at the time I make the examination. This method of follow-up reassures you of having the patient come back at shorter intervals than he otherwise would have done. I also advise at the time of examination that this is necessary, and that, in connection with the follow-up, as a general rule, brings back 75 per cent of these patients.

I also have a yearly follow-up and a two-year letter, which again asks them if they are experiencing comfort with their present correction, and advising them that certain naturaly psychological changes take place which make it necessary to have a re-examination of their eyes. I also use a folder follow-up to act as a contact medium for those who have had their eyes examined prior to two years ago.

Then occasionally I send a general follow-up letter out to every patient in my files. This becomes, of course, an expensive procedure unless you are very careful in checking your mailing list occasionally to see that it is kept up-to-date. This is part of your secretary's work, but you also should do it from time to time.

Your financial return in your practice greatly depends upon your own aggressiveness in your work and the carefulness with which you do your work, and the interest that you take in your patient public. You must at all times realize that you are constantly building for tomorrow. Your patient referrage to you, largely depends upon the carefulness of your diagnostic work in your examinations. Aside from a very careful refraction, you should always acquaint yourself to be on the lookout for any abnormal physical deficiency of your patient and diagnose same as correctly as is humanly possible. Wherever there is the least question of doubt, refer them to competent medical authorities for further check-up and have them referred back to you for refraction. I, as a general rule, when I anticipate an abnormal pathological condition, refract my patients and refer them to a competent medical authority to be referred back to me. I find this to be the most satisfactory method unless there is pathology concerning their eyes which should be taken care of prior to refraction. I have found over a period of years that a

very careful diagnostic method of handling my patients has been a great practice builder for me.

So this brings me to this point, that those who have served optometry as leaders up to this time are not necessarily qualified to continue to serve it as they now are in the future. The methods which have been commonly in use must and will be radically changed because they no longer serve successfully to combat the present changed conditions and professional competition. We all must strive to give a better, more intelligent, more honest, more value-receiving service to our patients. Our present leaders will gradually give way to better trained, better informed men whose technical training is such that they can logically and successfully take up the work where the former leaders left off. "Catch the falling torch" as it were, "and carry it to heights which the others could not possibly achieve." And here lies the difference between the graduates of the present day high class optometry schools and many of the old time practitioners. The latter started with little or nothing. Like the pioneers of old, they had to grope their way through the then untracked forests of refraction, and with difficulty, fight enemies eager to stay their progress. They had to fashion their own weapons and tools, build their habitation out of the raw material at hand, and at great labor, effect a clearing in which they could work undisturbed to produce the wherewithal to sustain life and assure easier conditions under which those who came after could work. But the newcomer in practice—how different his position is from that of the pioneer! He inherits all of the advantages the pioneer accumulated and few of the disadvantages. He has found his habitation awaiting him. His field is ready to be filled by intensive culture, strong stockades of laws to defend him while he labors, and ample time on his hands for studying the developments of superior fruits of endeavor, for the creation of a paradise beyond the ken of the pioneer.

Not only is his bare existence assured, but he has a knowledge, wisdom and experience, and other elements which thousands of his predecessors have painfully and at great sacrifice gathered, and with which he can now enrich not only his own life, but the lives of countless multitudes. He can perfect an environment which may make him the respect of all and give him a beneficient power unsurpassed except possibly by those in one other profession. Not only from my own experience, but from the experience of many others, do I know that it is not necessary for the intensively educated graduates of optometry schools to resort to the methods commonly used to build an optometric practice. A great many of these young men are adhering to strictly professional methods and are among our most successful practitioners. They practice in office buildings, refrain from flaming advertisements, and dispense high-class service.

Nevertheless, if optometry is ever to become a profession recognized equal to any other, the persistent employment of the subtler laws

of psychology, the laws which are operating among people of the highest intellect, is absolutely necessary. They promote better scientific work, inculcate in the laymen greater respect for optometry, increases the operator's self respect, and augments his financial returns. The older optometric practitioners employed methods of gaining practices which were not consistent with their claims of professionalism and with the methods of other professions. Probably they did this because they lacked the same degree of technical training which those in other professions possessed. Perhaps they could not make sufficient money without resorting to such business tactics. But now that optometry has had well regulated laws for years in every state in the United States, we should set our house in order nationally as well as state-wide and regulate greater numbers of practices along the lines which I mentioned earlier. That is, if we are to have the public recognize us generally as a profession, let us act as professional men, conduct our practices along professional lines and gain the respect that is due us by putting our house in the order that it should be in.

I further believe it is quite possible that optometric science stands today in almost the same relationship to the near future as it stood in 1800 with reference to the succeeding century. It is hardly possible that in 1800 the wildest visionary could conceive of a world "glassed." None could foresee the time when civilization would depend to no small degree upon little bits of glass before the eyes. Who, then, would dare prophesy that these same bits of glass would relieve the long list of ailments, which we now know they do daily alleviate?

And, what cautious person would deny the possibility that the important position which optometry now occupies is but the prologue to a vastly more important one which it may occupy in the not distant future? When we view in retrospect the amazing accomplishments which have taken place in the past fifty years, bold indeed would be he who had the temerity to reject the possibility of subsequent accomplishments which have again and again been paralleled within the memory of the present generation.

I can easily imagine optometry growing—expanding—absorbing —until it becomes recognized as one of the dominant professions. It deals with that organ which is valued above all others. It circumvents nature by neutralizing congenital and acquired defects so that the brain can easily receive true images of the outer world. It practically doubles the period during which the brain is intelligently acquisitive regarding those things which require close application of the eyes. It makes the race healthier, happier and more normal in all respects.

When it is reflected that the brain receives something like 87 per cent of its knowledge through the eyes, the enormity of this service which optometry renders begins to be appreciated. Actually, when we take into consideration this prolongation of intellectual acquisitiveness, combined with the fact that the productive period of the brain is like-

wise doubled, or more than doubled, it is easy to see that the intellectual activities have more than tripled in value through the influence of optometry.

Since the beneficent effect of optometry is so evident, it is clearly the duty of its practitioners to spread this knowledge to the utmost of their ability. Probably ten per cent of the population of this country are now wearing glasses. It is conservatively estimated that at least 50 per cent have eyes defective enough to justify the wearing of glasses. Think of the enormous increase in productive power that would be almost sure to take place if all of these millions thus clarified the avenues to the brain or conserved the stupendous amount of nervous energy now going to waste!

But this is not the sole end and aim of optometry. After thousands of years of recorded history, the human race still does not know how to live. It eats and drinks foolishly, sleeps improperly, exercises insufficiently or unwisely, and otherwise abuses the laws of nature. The inevitably severe penalty is exacted. Millions suffer from ill health. In this country alone hundreds of thousands die yearly from preventable diseases. Although the average length of life has been greatly extended, men and women paradoxically are dying younger than they used to. With all its marvelous accomplishments medicine has been unable to cope with the situation, chiefly because it can no more make the human race think intelligently than it can make more than ordinary mortals out of its individual practitioners.

With respect to this condition, optometry occupies a strategic position. In addition to being the gateway to the brain, the eye is a peephole into the body's laboratory. Here we can often see the results of profound changes which are taking place in the vital organs. And frequently these changes are here observed long before they are revealed under the microscope or by chemical analysis.

Therefore, moral obligation, if nothing else, forces the refractionist to give heed to the bodily welfare of his consultants. It is high time refractionists recognized this fact, and instead of adhering to the arbitrary boundaries of their work, gave freer reign to their activities in the interests of the physical welfare of the human race.

In the light of these facts, it is not unreasonable to believe in the possibility that some day in the near future optometry, because it just happens to stand at the gateway to the brain and at the windows of nature's laboratory, will be one of the great interpreventive professions. When we take all of these things into consideration, dare anyone set a limit to the possibilities of optometric work in the future? Dare anyone take upon himself the responsibility of saying, "Thou shalt not" when the welfare of the human race may be at stake?

DR. GEO. C. JENSON
260 BREMER ARCADE BLDG.
ST. PAUL, MINN.

# BOOK NOTICES

PSYCHOLOGY AND HEALTH, H. Banister, Published by the McMillan Co., 60 Fifth Ave., New York City. 256 pages, cloth, $2.50. 1935.

Psychology and Health by Banister is a valuable contribution which is of interest to not only the psychologist and the physician but to all those who are in any way dealing with human beings physically or mentally.

Banister points out that all the people who are ill may be divided into two classes. (1) Those suffering from organic diseases such as tuberculosis, rheumatism, paralysis, etc. (2) Those suffering from functional nervous disorders, or mental disturbances, and while places are provided for to take care of the organic cases the great majority of the functional cases, who are capable of being restored to health are entirely neglected. The reasons why the mental cases are neglected he gives the following: (1) The general practitioner lacks the knowledge necessary to deal with mental illness; (2) he does not have the time even if he has the knowledge to give psychological treatment; (3) there is a strong prejudice on the part of the patient and his doctor against the diagnosis of mental disorders. Because of the fact that such a diagnosis being regarded as social stigma very few patients in the primary stages of mental disturbance seek the assistance of a doctor.

He develops his thesis that functional abnormalities are mainly the cause of ill health by pointing out the psychological factors involved in most cases.

To remedy this condition he advises to utilize the psychological methods of suggestion, hypnosis, and psycho-analysis.

Banister like most other scientists interested in the health problem, stresses the importance of preventive measures and holds them to be as much or even more important than the curative measure and he strongly urges that dissemination of psychological knowledge especially the knowledge about the development of psycho-pathology will be of great help in preventing the development of functional disorders.

Psychology and Health has an important message for the physician, the optometrist, the teacher or any one interested in knowing the workings of the mind and their effect upon normal and abnormal physical and mental development. J. I. K.

BLINDNESS AND THE BLIND IN THE UNITED STATES. Harry Best. Published by the McMillan Co., New York City. 714 Pages, Cloth Binding, 1934.

In this book "Blindness and the Blind in the United States" the author covers the subject extensively from many different angles such as: the causes of blindness, the general condition of the blind, their physical and mental states, their economic status, the provisions for their education, in public and private institutions and the forms of instruction for the blind. The annual cost of education for a blind pupil averages about $600.

While this book has the sociological approach to the problem, yet it contains much information of value to the optometrists. There are given a very large number of tables which deal with statistical material covering such subjects as the cause of blindness, the increase of the number of blind, their geographical distribution, etc.

One may get some interesting and valuable information by studying the statistical data given by the author. For instance, by examining the table on the causes of blindness we find that 40 per cent are due to specific afflictions of the eye, 18 per cent to cataract and about 10 per cent to glaucoma, and particularly we find that cataract is on the increase. For example, of the blind admitted to the Pennsylvania institution in 1850 8.9 per cent were caused by cataract, and in 1932 it rose to 16.9 per cent. In the New York institution it increased from 8.2 per cent to 18 per cent. In Iowa from 3.3 per cent to 15.3 per cent. In tabulating blindness by age it is shown that in 1920 the group under 5 years of age gave 0.7 per cent of the blind and those of age 75 gave 8.8 per cent. In 1930, ten years later the figure increased to 0.8 per cent and 10.3 per cent respectively. There is thus an increase of 1.5 per cent in the upper age group in the short period of ten years.

From his exhaustive study Best concludes that with all the late advances in ocular science cataract and glaucoma are still on the increase and surgery is the only help these patients can look forward to.

Best furnished a source book which contains valuable information for the sociologists, social worker, ophthalmologists and optometrists.

In collecting and publishing this enormous amount of data Best has rendered a valuable service to all those who are interested in the prevention of blindness as well as to the blind themselves. J. I. K.

BACK COPY

WANTED

The Library of the University of Minnesota is in need of a copy of the January 1932 issue of the American Journal of Optometry.

Any one who can spare this copy please write to
The American Journal
of Optometry
Foshay Tower
Minneapolis, Minnesota

BACK COPIES

WANTED

Three students at the Northern Illinois College of Optometry are each anxious to secure the 1932, 1933 and 1934 volumes of the American Journal of Optometry and the January to August 1935 copies (inclusive)

Any one who can supply these back numbers write to

JOSEPH LEHRMAN
Northern Illinois College of Optometry
4043 Drexel Blvd. Chicago, Ill.

HOW WELL DO YOU KNOW MODERN BIFOCAL PRACTICE ?

*Solution to problem on page VII*

This patient needs, for safety in his occupation, a bifocal that will give the addition required for inspection of his work, minimized jump of image, and especially minimized displacement of objects seen through the reading area. A false step caused by apparent displacement of a girder might prove fatal.

The top of the segment can be placed 3 mm below distance center for best occupational as well as avocational use.

In general, the reading area is not needed for the games of bowling and pool, the head being tilted downward in playing, and consequently the reading field will not interfere.

Displacement of objects through the near point field of the bifocal can be predetermined for any type bifocal. In this particular Rx, the location of the optical center of the reading part is 5.25 mm below the distance center. The point chosen by the patient as most advantageous for his near point tasks is 6 mm below distance center. There will be, therefore, practically speaking, no displacement of objects seen through the segment since the optical center and chosen reading point agree sensibly.

Likewise, jump of image at the dividing line between distance and near fields is minimized.

In addition, the reading segments in these Panoptik bifocals are color-free and, because of this, an extended usable near point range is evident and advantageous to the patient.

From the Bausch & Lomb table of bifocal insets we find that the segment inset should be 2.0 mm for the O.D. and 1.9 mm for the O. S., since the semi-pupillary distances are 34 mm and 32 mm respectively and the power of the distance lens in the 180° meridian is +1.00 diopter.

Panoptiks are by far the most suitable choice. *"In Soft-Lite, too."*

PRESCRIBE AND FIT
BAUSCH & LOMB PANOPTIKS